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                    RAW SEQUENCE LISTING              DATE: 10/30/2001
                    PATENT APPLICATION:  US/09/977,897     TIME: 14:43:40

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      3 <110> APPLICANT: Chen, Yih-Tai
      4   Cao, Longguang
      6 <120> TITLE OF INVENTION: A synthetic DNA encoding an orange seapen-derived green
fluorescent
      7   protein with codon preference of mammalian expression systems and biosensors
      9 <130> FILE REFERENCE: 41856-5
C--> 11 <140> CURRENT APPLICATION NUMBER: US/09/977,897
C--> 11 <141> CURRENT FILING DATE: 2001-10-15
     11 <160> NUMBER OF SEQ ID NOS: 27
     13 <170> SOFTWARE: PatentIn version 3.1
     15 <210> SEQ ID NO: 1
     16 <211> LENGTH: 1482
     17 <212> TYPE: DNA
     18 <213> ORGANISM: Ptilosarcus gurneyi
     20 <400> SEQUENCE: 1
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     25 ggcaagggca acgtgctgtt cggcaaccag ctgatgcaga tccgggtgac caagggcggc   180
     27 cctctgcct tcgccttcga catcgtgagc atcgccttcc agtacggcaa ccggaccttc   240
     29 accaagtatc ccgacgacat cgccgactac ttcgtgcaga gcttccctgc cggcttcttc   300
     31 tacgagcgga acctgcggtt cgaggacggc gccatccggg acatccggag cgacatcagc   360
     33 ctggaggacg acaagttcca ctacaaggtg gagtaccgcg gcaacggctt ccctagcaac   420
     35 ggccctgtga tgcagaaggc catcctgggc atggagccca gcttcgaggt ggtgtacatg   480
     37 aacagcggcg tgctggtggg cgaggtggac ctggtgtaca agctggagag cggcaactac   540
     39 tacagctgcc acatgaagac cttctacggc agcaagggcg gcgtgaagga gttccctgag   600
     41 tacctattca tccaccaccg gctggagaag aactacgtgg aggagggcag cttcgtggag   660
     43 cagcacgaga ccgccatcgc ccagctgacc accatcggca agcctctggg cagcctgcac   720
     45 gagtgggtgt aaagcggccg caagcttgcc accatggtga accggaacgt gctgaagaac   780
     47 accggcctga aggagatcat gagcgccaag gccagcgtgg agggcatcgt gaacaaccac   840
     49 gtgttcagca tggagggctt cggcaagggc aacgtgctgt tcggcaacca gctgatgcag   900
     51 atccgggtga ccaagggcgg ccctctgccc ttcgccttcg acatcgtgag catcgccttc   960
     53 cagtacggca accggacctt caccaagtat cccgacgaca tcgccgacta cttcgtgcag 1020
     55 agcttccctg ccggcttctt ctacgagcgg aacctgcggt tcgaggacgg cgccatcgtg 1080
     57 gacatccgga gcgacatcag cctggaggac gacaagttcc actacaaggt gaaagggtgc 1140
     59 ggcaacggct tccctagcaa cggcccctgtg atgcagaagg ccatcctggg catggagccc 1200
     61 agcttcgagg tggtgtacat gaacagcggc gtgctggtgg gcgaggtgga cctggtgtac 1260
     63 aagctggaga gcggcaacta ctacagctgc cacatgaaga ccttctaccg gagcaagggc 1320
     65 ggcgtgaagg agttccctga gtacctattc atccaccacc ggctggagaa gaactacgtg 1380
     67 gaggagggca gcttcgtgga gcagcacgag accgccatcg cccagctgac caccatcggc 1440
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     73 <211> LENGTH: 239
     74 <212> TYPE: PRT
     75 <213> ORGANISM: Ptilosarcus gurneyi
     77 <400> SEQUENCE: 2
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     80 1   5   10   15
     83 Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser

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                    RAW SEQUENCE LISTING            DATE: 10/30/2001
                    PATENT APPLICATION:  US/09/977,897   TIME: 14:43:40

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84                  20                  25                  30
87 Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
88        35                  40                  45
91 Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
92    50                  55                  60
95 Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
96 65                  70                  75                  80
99 Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
100                 85                  90                  95
103 Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
104            100                 105                 110
107 Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
108            115                 120                 125
111 Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
112        130                 135                 140
115 Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
116 145                 150                 155                 160
119 Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
120                 165                 170                 175
123 Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
124            180                 185                 190
127 Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
128        195                 200                 205
131 Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
132    210                 215                 220
135 Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
136 225                 230                 235
139 <210> SEQ ID NO: 3
140 <211> LENGTH: 224
141 <212> TYPE: PRT
142 <213> ORGANISM: Ptilosarcus gurneyi
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146 Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
147 1                  5                  10                  15
150 Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
151        20                  25                  30
154 Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
155        35                  40                  45
158 Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
159    50                  55                  60
162 Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
163 65                  70                  75                  80
166 Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
167                 85                  90                  95
170 Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
171            100                 105                 110
174 Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
175            115                 120                 125
178 Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
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                  RAW SEQUENCE LISTING                 DATE: 10/30/2001
                  PATENT APPLICATION:  US/09/977,897   TIME: 14:43:40

                  Input Set : A:\ES.txt
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179     130                     135                    140
182 Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
183 145                     150                    155                    160
186 Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
187                     165                    170                    175
190 Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
191                     180                    185                    190
194 Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195     195                     200                    205
198 Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
199     210                     215                    220
202 <210> SEQ ID NO: 4
203 <211> LENGTH: 219
204 <212> TYPE: PRT
205 <213> ORGANISM: Ptilosarcus gurneyi
207 <400> SEQUENCE: 4
209 Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val Glu Gly Ile Val
210 1                   5                    10                     15
213 Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly Asn Val Leu
214                     20                    25                     30
217 Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys Gly Gly Pro Leu
218     35                     40                    45
221 Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg
222     50                     55                    60
225 Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser
226 65                    70                     75                     80
229 Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly
230                     85                    90                     95
233 Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe
234     100                    105                    110
237 His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro
238     115                    120                    125
241 Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe Glu Val Val
242     130                    135                    140
245 Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu Val Tyr Lys
246 145                    150                    155                    160
249 Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys Thr Phe Tyr Arg
250                     165                    170                    175
253 Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His Phe Ile His His
254                     180                    185                    190
257 Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe Val Glu Gln His
258     195                    200                    205
261 Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly
262     210                    215
265 <210> SEQ ID NO: 5
266 <211> LENGTH: 238
267 <212> TYPE: PRT
268 <213> ORGANISM: Ptilosarcus gurneyi
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272 Met Val Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser
273 1               5                   10                  15
276 Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met
277             20                  25                  30
280 Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln
281         35                  40                  45
284 Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val
285     50                  55                  60
288 Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp
289 65                  70                  75
292 Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr
293             85                  90                  95
296 Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser
297             100                 105                 110
300 Asp Ile Ser Leu Glu Glu Asp Lys Phe His Tyr Lys Val Glu Tyr Arg
301         115                 120                 125
304 Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu
305     130                 135                 140
308 Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu
309 145                 150                 155                 160
312 Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr
313                 165                 170                 175
316 Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu
317                 180                 185                 190
320 Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val
321         195                 200                 205
324 Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu
325     210                 215                 220
328 Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
329 225                 230                 235
332 <210> SEQ ID NO: 6
333 <211> LENGTH: 237
334 <212> TYPE: PRT
335 <213> ORGANISM: Ptilosarcus gurneyi
337 <400> SEQUENCE: 6
339 Met Val Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala
340 1               5                   10                  15
343 Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu
344             20                  25                  30
347 Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile
348         35                  40                  45
351 Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser
352     50                  55                  60
355 Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp
356 65                  70                  75                  80
359 Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu
360             85                  90                  95
363 Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp
364             100                 105                 110
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RAW SEQUENCE LISTING   DATE: 10/30/2001
PATENT APPLICATION: US/09/977,897   TIME: 14:43:40

Input Set : A:\ES.txt
Output Set: N:\CRF3\l0302001\I977897.raw

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367 Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly
368       115                 120                 125
371 Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly
372     130                 135                 140
375 Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val
376 145                 150                 155                 160
379 Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser
380                 165                 170                 175
383 Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe
384             180                 185                 190
387 Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu
388         195                 200                 205
391 Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr
392     210                 215                 220
395 Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
396 225                 230                 235
399 <210> SEQ ID NO: 7
400 <211> LENGTH: 236
401 <212> TYPE: PRT
402 <213> ORGANISM: Ptilosarcus gurneyi
404 <400> SEQUENCE: 7
406 Met Val Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys
407 1               5                   10                  15
410 Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly
411             20                  25                  30
414 Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg
415         35                  40                  45
418 Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile
419     50                  55                  60
422 Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile
423 65                  70                  75                  80
426 Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg
427             85                  90                  95
430 Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile
431         100                 105                 110
434 Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn
435     115                 120                 125
438 Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met
439 130                 135                 140
442 Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly
443 145                 150                 155                 160
446 Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys
447             165                 170                 175
450 His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro
451         180                 185                 190
454 Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu
455     195                 200                 205
458 Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr
459 210                 215                 220
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VERIFICATION SUMMARY   DATE: 10/30/2001
PATENT APPLICATION: US/09/977,897   TIME: 14:43:41

Input Set : **A:\ES.txt**
Output Set: **N:\CRF3\10302001\I977897.raw**

L:11 M:270 C: Current Application Number differs, Replaced Current Application No
L:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date